**SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd.**

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# *TEST REPORT*

| | |
|---|---|
| **Application No. :** | SHEM120300025512 |
| **Applicant:** | ICP Electronics Inc. |
| **Manufacturer:** | Armorlink SH Corp. |
| **FCC ID:** | RFH410UPC-V312 |
| **Fundamental Frequency** : | 13.56MHz |
| **Equipment Under Test (EUT):** | |
| **Product Name:** | PANEL PC |
| **Brand Name:** | iEi |
| **Model No.:** | UPC-V312-D525 |
| **Standards:** | FCC PART 15 SUBPART C, Section 15.225 |
| **Date of Receipt:** | Mar. 12, 2012 |
| **Date of Test:** | May 13, 2012 to August 13, 2012 |
| **Date of Issue:** | August 15, 2012 |
| **Test Result :** | **PASS *** |

* In the configuration tested, the EUT complied with the standards specified above.

Jim Xu
E&E Section Head
SGS-CSTC(Shanghai) Co., Ltd.

Neil Zhang
E&E Project Engineer
SGS-CSTC(Shanghai) Co., Ltd.

# 2 Test Summary

| TEST ITEM | FCC REFERANCE | RESULT |
|---|---|---|
| Field Strength of Fundamental and Radiated Emission | 15.225(a)(b)(c)(d) & 15.209 | Pass |
| Power Line Conducted Emission | 15.207 | Pass |
| Occupied Bandwidth | 15.215(c) | Tested |
| Frequency Tolerance | 15.225(e) | Pass |
| Antenna Requirement | 15.203 | Compliance |

Noted： “-” means not require in the rules.

# 3 Contents

# 4 General Information

## 4.1 Client Information

| | |
|---|---|
| Applicant : | ICP Electronics Inc. |
| Applicant Address: | 3F., No.22, Zhongxing Rd., Xizhi Dist., New Taipei City 221, Taiwan, R.O.C |
| Manufacturer: | Armorlink SH Corp. |
| Manufacturer Address: | 515.Shenfu Rd,Xinzhuang Industrial Development Zone,Minhang District,Shanghai,P.R.China |

## 4.2 Details of E.U.T.

| | | |
|---|---|---|
| Product Name | PANEL PC | |
| Brand Name | iEi | |
| Model No. | UPC-V312-D525 | |
| Antenna Type | Loop Antenna | |
| Rated Input: | Power 1: 10.5Vdc-36Vdc, 2.5A-8.57A (Power form DC Jack via AC/DC Adapter)<br>Power 2: 9Vdc-36Vdc, 2.5A-10A (Power form terminal block) | |
| Adapter: | Manufacturer: | FSP Group Inc. |
| | Model No.: | FSP065-RAB |
| | Rated Input: | AC 100V-240V 50-60Hz 1.5A |
| | Rated Output: | DC 19V 3.42A |
| Frequency | 13.56MHz | |
| Modulation Type: | ASK(100% ASK , OOK) | |

## 4.3 Description of Support Units

| Name | Model No. | Remark |
|---|---|---|
| N/A | N/A | N/A |

## 4.4 Test Location

Tests were performed at:
SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd.
No.588 West Jindu Road, Songjiang District, Shanghai, China. 201612.
Tel: +86 21 6191 5666 Fax: +86 21 6191 5655
No tests were sub-contracted.

## 4.5 Other Information Requested by the Customer

None.

## 4.6 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

- **CNAS (No. CNAS L0599)**

CNAS has accredited SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. to ISO/IEC 17025:2005 General Requirements for the Competence of Testing and Calibration Laboratories (CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) for the competence in the field of testing. Date of expiry: 2014-07-26.

- **FCC – Registration No.: 402683**

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been registered and fully described in a report filed with the Federal Communications Commission (FCC). The acceptance letter from the FCC is maintained in our files. Registration No.: 402683, Expiry Date: 2015-02-22.

- **Industry Canada (IC) – IC Assigned Code: 8617A**

The 3m Semi-anechoic chamber of SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 8617A. Expiry Date: 2014-09-20.

## Test Results

### 4.7 Test Instruments

| Item | Test Equipment | Manufacturer | Model No. | Serial No. | Cal. Date | Cal. Due date |
|---|---|---|---|---|---|---|
| 1 | EMI test receiver | Rohde & Schwarz | ESU40 | 100109 | 2012-6-4 | 2013-6-3 |
| 2 | Horn Antenna | SCHWARZBECK | BBHA9120D | 9120D-679 | 2012-6-4 | 2013-6-3 |
| 3 | Horn Antenna | Rohde & Schwarz | HF906 | 100284 | 2012-3-12 | 2013-3-10 |
| 4 | ANTENNA | SCHWARZBECK | VULB9168 | 9168-313 | 2012-6-4 | 2013-6-3 |
| 5 | Ultra broadband antenna | Rohde & Schwarz | HL562 | 100227 | 2011-10-8 | 2012-10-7 |
| 6 | Atmosphere pressure meter | Shanghai ZhongXuan Electronic Co;Ltd | BY—2009P | -- | 2011-10-14 | 2012-10-15 |
| 7 | CLAMP METER | FLUKE | 316 | 86080010 | 2012-4-22 | 2013-4-20 |
| 8 | Thermo-Hygrometer | ZHICHEN | ZC1-2 | 01050033 | 2012-10-14 | 2013-10-15 |
| 9 | High-low temperature cabinet | Shanghai YuanZhen | GW2050 | -- | 2011-09-05 | 2012-09-03 |
| 11 | Tunable Notch Filter | Wainwright instruments Gmbh | WRCT1800.0/2000.0-0.2/40-5SSK | 11 | 2012-6-16 | 2013-6-15 |
| 12 | Tunable Notch Filter | Wainwright instruments Gmbh | WRCT800.0/880.0-0.2/40-5SSK | 9 | 2012-5-7 | 2013-5-6 |
| 13 | High pass Filter | FSCW | HP 12/2800-5AA2 | 19A45-02 | 2012-5-5 | 2013-5-4 |
| 14 | Low nosie amplifier | TESEQ | LNA6900 | 70133 | 2012-6-4 | 2013-6-3 |
| 15 | EMI test receiver | Rohde & Schwarz | ESCS30 | 100086 | 2012-4-8 | 2013-4-7 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 16 | Line impedance stabilization network | SCHWARZBECK | NSLK8127 | 8127-490 | 2012-05-07 | 2013-05-06 |
| 17 | Loop Antenna | Schaffner | HLA6120 | 1193 | 2012-05-06 | 2013-05-05 |

**Permitted frequency range**

| Item | Test Equipment | Manufacturer | Model No. | Serial No. | Cal. Date | Cal. Due date |
|---|---|---|---|---|---|---|
| 18 | Spectrum Analyzer | Rohde & Schwarz | FSP-30 | 2705121009 | 2012-04-13 | 2013-04-12 |
| 19 | Temperature and Humidity Test Chamber | Shanghai YuanZhen | GW2050 | -- | 2011-09-05 | 2012-09-03 |

## 4.8 E.U.T. Operation

Input voltage: 120V/60Hz supply for the adapter and 9V~36V DC supply for the terminal block.

Operating Environment:

Temperature: 25.0 °C

Humidity: 45 % RH

Atmospheric Pressure: 1010 mbar

EUT Operation: The EUT and the Support equipment are configured to create an operating communication link under RFID status.

## 4.9 Test Procedure & Measurement Data

### 4.9.1 Field Strength of Fundamental and Radiated Spurious Emission

**Test Requirement:** FCC §15.225 , §15.209

**Test date:** August 13, 2012

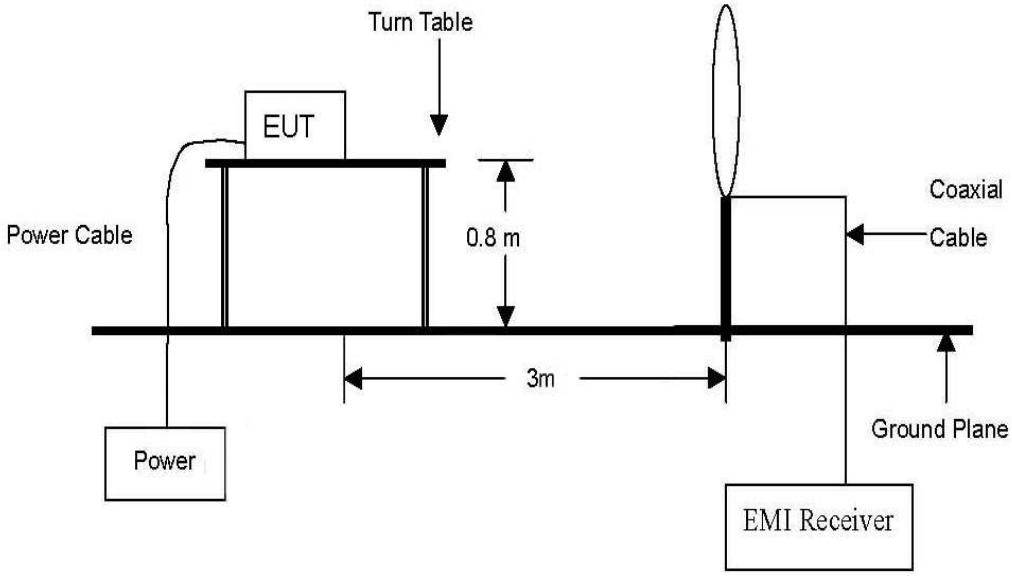
**Standard Applicable** ANSI C63.10:2009

**Test Procedures:**

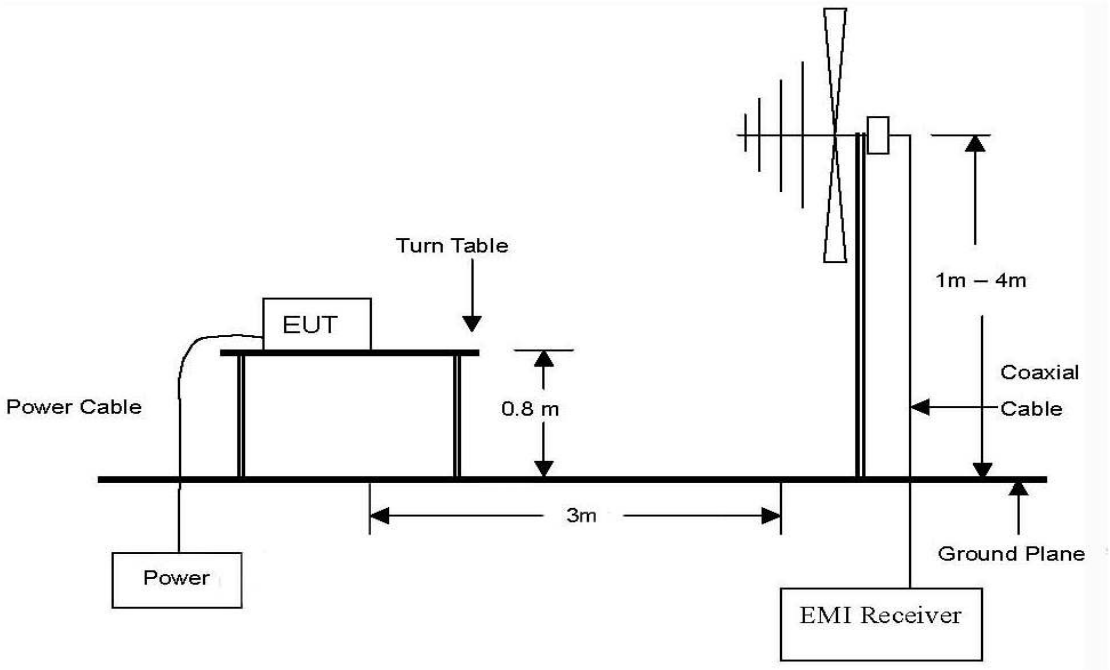
1.Test Procedures for emission from 9 kHz to 30 MHz
a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter anechoic chamber test site. The table was rotated 360 degrees to determine the position of the highest radiation.
b. Then antenna is a loop antenna is fixed at one meter above the ground to determine the maximum value of the field strength. Both parallel and perpendicular of the antenna are set to make the measurement.
c. For each suspected emission, the EUT was arranged to its worst case and then the table was turned from 0 degrees to 360 degrees to find the maximum reading.
d. The test-receiver system was set to Peak and Quasi-Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
2.Test Procedures for emission from 30 MHz to 1000 MHz
a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter anechoic chamber test site. The table was rotated 360 degrees to determine the position of the highest radiation.
b. During performing radiated emission below 1 GHz, the EUT was set 3 meters away from the interference receiving antenna, which was mounted on the top of a variable-height antenna tower. During performing radiated emission above 1 GHz, the EUT was set 1 meter away from the interference-receiving antenna.
c. The antenna is a broadband antenna, and its height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations ofthe antenna are set to make the measurement.
d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the table was turned from 0 degrees to 360 degrees to find the maximum reading.
e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
f. If the emission level of the EUT in peak mode was 10 dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10 dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

**EUT Setup:**

The diagram below shows the test setup that is utilized to make the measurements for emission from 9 kHz to 30MHz Emissions.




The diagram below shows the test setup that is utilized to make the measurements for emission from 30 MHz to 1 GHz Emissions.



**Measurement Result**

The following table shows the highest levels of radiated emissions on both polarizations of horizontal and vertical.

## Radiated Spurious Emissions Limits

| Frequency (MHz) | Limit (μV/m) | Rule Part Reference |
|---|---|---|
| 13.553 - 13.567 | 15,848 (@ 30m) | §15.225(a) |
| 13.410 – 13.553 | 334 (@ 30m) | §15.225(b) |
| 13.567 – 13.710 | 334 (@ 30m) | §15.225(b) |
| 13.110 – 13.410 | 106 (@ 30m) | §15.225(c) |
| 13.710 – 14.010 | 106 (@ 30m) | §15.225(c) |
| 1.705 – 13.110<br>14.010 – 30.0 | 30 (@ 30m) | §15.225(d), §15.209 |
| 30.00 – 88.00 | 100 (@ 3m) | §15.225(d), §15.209 |
| 88.00 – 216.00 | 150 (@ 3m) | §15.225(d), §15.209 |
| 216.00 – 960.00 | 200 (@ 3m) | §15.225(d), §15.209 |
| Above 960 | 500 (@ 3m) | §15.225(d), §15.209 |

## Radiated Emission Test Data, Fundamental Frequency

**15.225 Operation within the band 13.110 – 14.010 MHz.**

(a) The field strength of any emissions within the band 13.553-13.567 MHz shall not exceed 15,848 microvolts/meter (= 83.9 dBuV/m) at 30 meters.

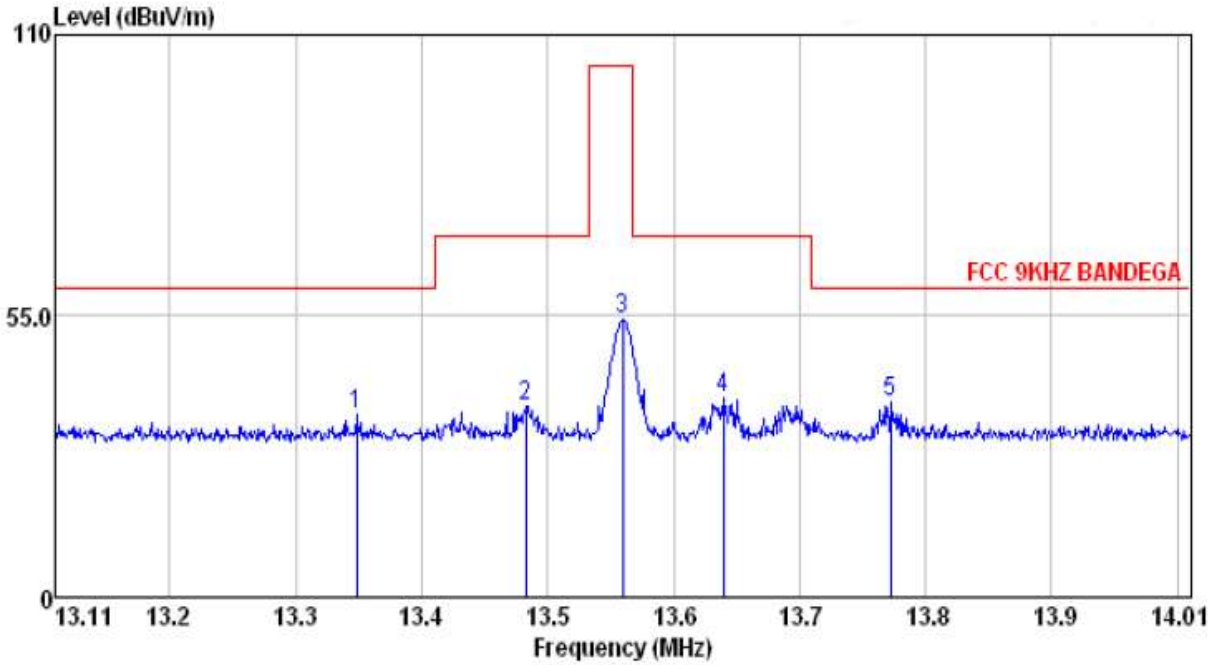
## Radiated Emission

(b) Within the bands 13.410-13.553 MHz and 13.567-13.710 MHz, the field strength of any emissions shall not exceed 334 microvolts/meter (=50.5dBuV/m) at 30 meters.

(c) Within the bands 13.110-13.410 MHz and 13.710-14.010 MHz the field strength of any emissions shall not exceed 106 microvolts/meter (=40.5 dBuV/m) at 30 meters.

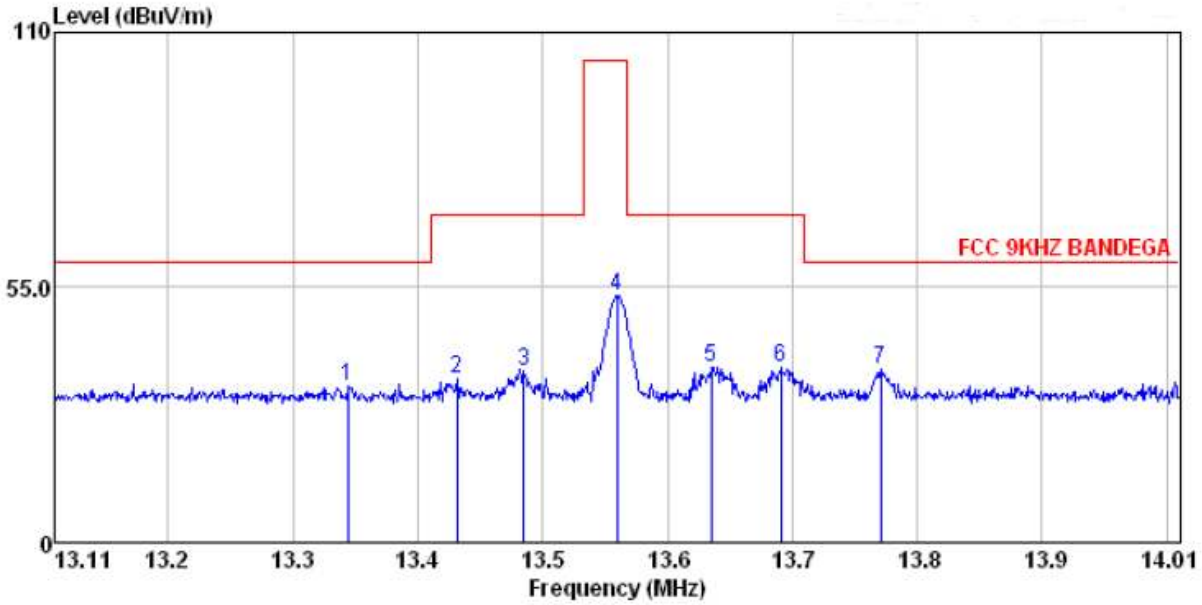
**Measurement Result**

**Antenna Horizontal**




| | Freq | Read Level | Antenna Factor | Cable Loss | Preamp Factor | Level | Limit Line | Over Limit |
|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV | dB/m | dB | dB | dBuV/m | dBuV/m | dB |
| 1 | 13.35 | 11.98 | 22.87 | 1.07 | 0.00 | 35.92 | 60.50 | -24.58 |
| 2 | 13.48 | 13.62 | 22.85 | 1.07 | 0.00 | 37.54 | 70.50 | -32.96 |
| 3 | 13.56 | 30.46 | 22.84 | 1.07 | 0.00 | 54.37 | 104.00 | -49.63 |
| 4 | 13.64 | 15.17 | 22.84 | 1.07 | 0.00 | 39.08 | 70.50 | -31.42 |
| 5 pp | 13.77 | 14.31 | 22.82 | 1.08 | 0.00 | 38.21 | 60.50 | -22.29 |

**Antenna Vertical**




| | Freq | Read Level | Antenna Factor | Cable Loss | Preamp Factor | Level | Limit Line | Over Limit |
|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV | dB/m | dB | dB | dBuV/m | dBuV/m | dB |
| 1 | 13.34 | 9.57 | 22.87 | 1.07 | 0.00 | 33.51 | 60.50 | -26.99 |
| 2 | 13.43 | 11.27 | 22.86 | 1.07 | 0.00 | 35.20 | 70.50 | -35.30 |
| 3 | 13.49 | 13.06 | 22.85 | 1.07 | 0.00 | 36.98 | 70.50 | -33.52 |
| 4 | 13.56 | 29.25 | 22.84 | 1.07 | 0.00 | 53.16 | 104.00 | -50.84 |
| 5 | 13.63 | 13.74 | 22.84 | 1.07 | 0.00 | 37.65 | 70.50 | -32.85 |
| 6 | 13.69 | 13.68 | 22.83 | 1.07 | 0.00 | 37.58 | 70.50 | -32.92 |
| 7 pp | 13.77 | 13.26 | 22.82 | 1.08 | 0.00 | 37.16 | 60.50 | -23.34 |

| Radiated Emissions | | | Ant | Correction Factors | Total | FCC Limit | |
|---|---|---|---|---|---|---|---|
| Frequency (MHz) | Reading (dBuV) | Detect Mode | Pol. | Ant.(dB/m) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) |
| 13.56 | 30.46 | QP | H | 23.91 | 54.37 | 124 | -69.63 |
| 13.56 | 29.25 | QP | V | 23.91 | 53.16 | 124 | -70.84 |

**Remark：**
1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)
3. Margin value = Emission level – Limit value.
4. 3m Limit(dBuV/m) = 20log(15848)+40log(30/3)
= 84+40log(30/3)
= 84+40
= 124

The EUT is a fixed device, so one axes (X lie down) were observed while the test receiver worked as "max hold" continuously and the highest reading among the whole test procedure was recorded. Pretest at 120V/60Hz supply for the AC/DC adapter and 9~36V DC supply for the terminal block,worst case was found at the 120/60Hz supply.

(d) The field strength of any emissions appearing outside of the 13.110-14.010 MHz band shall not exceed the general radiated emission limits in § 15.209.

9KHz~30MHz Radiated Emission

| Radiated Emissions | | | Ant | Correction Factors | Total | FCC Limit | |
|---|---|---|---|---|---|---|---|
| Frequency (MHz) | Reading (dBuV) | Detect Mode | Pol. | Ant.(dB/m) | Emission Level (dBuV/m) | Average Limit (dBuV/m) | Margin (dB) |
| 0.17 | 20.08 | QP | H | 24.08 | 44.16 | 103.1 | -58.94 |
| 0.63 | 23.75 | QP | H | 24.17 | 47.92 | 71.7 | -23.78 |
| 27.12 | 18.51 | QP | H | 25.06 | 43.57 | 69.50 | -25.93 |
| 0.17 | 20.10 | QP | V | 24.08 | 44.18 | 103.1 | -58.92 |
| 0.63 | 18.28 | QP | V | 24.17 | 42.45 | 71.7 | -29.25 |
| 27.12 | 19.12 | QP | V | 25.06 | 44.18 | 69.50 | -25.32 |

**Remark:**
1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. Above limits have been translated by the formula
Pretest at 120V/60Hz supply for the AC/DC adapter and 9~36V DC supply for the terminal block,worst case was found at the 120/60Hz supply.

## 30MHz~1GHz

### Antenna Horizontal

| Frequency (MHz) | QuasiPeak (dBµV/m) | Meas. Time (ms) | Bandwidth (kHz) | Antenna height (cm) | Polarity | Turntable position (deg) | Corr. (dB) | Margin (dB) |
|---|---|---|---|---|---|---|---|---|
| 100.165450 | 25.3 | 1000.000 | 120.000 | 100.0 | H | 232.0 | 10.2 | 18.20 |
| 90.546153 | 20.3 | 1000.000 | 120.000 | 100.0 | H | 158.0 | 9.5 | 23.20 |
| 40.485642 | 15.4 | 1000.000 | 120.000 | 100.0 | H | 253.0 | 13.9 | 24.60 |
| 36.546515 | 20.3 | 1000.000 | 120.000 | 100.0 | H | 261.0 | 12.9 | 19.70 |
| 366.674560 | 41.3 | 1000.000 | 120.000 | 100.0 | H | 271.0 | -8.2 | 4.70 |
| 500.000480 | 40.2 | 1000.000 | 120.000 | 100.0 | H | 244.0 | -5.2 | 5.80 |

(continuation of the "Final Result 1" table from column 9 ...)

| Frequency (MHz) | Limit (dBµ | Comment |
|---|---|---|
| 100.165450 | 43.50 | |
| 90.546153 | 43.50 | |
| 40.485642 | 40.00 | |
| 36.546515 | 40.00 | |
| 366.674560 | 46.00 | |
| 500.000480 | 46.00 | |

### Antenna Vertical

| Frequency (MHz) | QuasiPeak (dBµV/m) | Meas. Time (ms) | Bandwidth (kHz) | Antenna height (cm) | Polarity | Turntable position (deg) | Corr. (dB) | Margin (dB) |
|---|---|---|---|---|---|---|---|---|
| 324.492000 | 40.2 | 1000.000 | 120.000 | 100.0 | V | 46.0 | 15.3 | 5.80 |
| 716.561280 | 43.6 | 1000.000 | 120.000 | 100.0 | V | 162.0 | 0.0 | 2.40 |
| 31.531795 | 30.4 | 1000.000 | 120.000 | 100.0 | V | 191.0 | -12.1 | 9.60 |
| 35.271520 | 36.6 | 1000.000 | 120.000 | 111.0 | V | 33.0 | -11.8 | 3.40 |
| 40.331520 | 29.8 | 1000.000 | 120.000 | 112.0 | V | 272.0 | -10.9 | 10.20 |
| 161.971040 | 25.5 | 1000.000 | 120.000 | 100.0 | V | 30.0 | -10.8 | 18.00 |

(continuation of the "Final Result 1" table from column 9 ...)

| Frequency (MHz) | Limit (dBµ | Comment |
|---|---|---|
| 324.492000 | 46.00 | |
| 716.561280 | 46.00 | |
| 31.531795 | 40.00 | |
| 35.271520 | 40.00 | |
| 40.331520 | 40.00 | |
| 161.971040 | 43.50 | |

Remark: Pretest at 120V/60Hz supply for the AC/DC adapter and 9~36V DC supply for the terminal block,worst case was found at the 120/60Hz supply.

## 4.9.2 Conducted Emission Test

**Test Requirement:** FCC Part15 15.207

**Test date:** May. 18, 2012

**Standard Applicable** According to section 15.207,frequency 150KHz to 30MHz shall not exceed the limit table as blew.

| Frequency of Emission (MHz) | Conducted Limit (dBuV) | |
|---|---|---|
| | Quasi-peak | Average |
| 0.15-0.5 | 66 to 56 * | 56 to 46 * |
| 0.5-5 | 56 | 46 |
| 5-30 | 60 | 50 |

*

**EUT Setup**

1.The conducted emission tests were performed in the test site,using the setup in accordance with the ANSI C63.10-2009.

2.EUT is connect with AC Power adaptor was plug-in LISN.The rear of the EUT and peripherals were placed flushed with the rear of the tabletop.

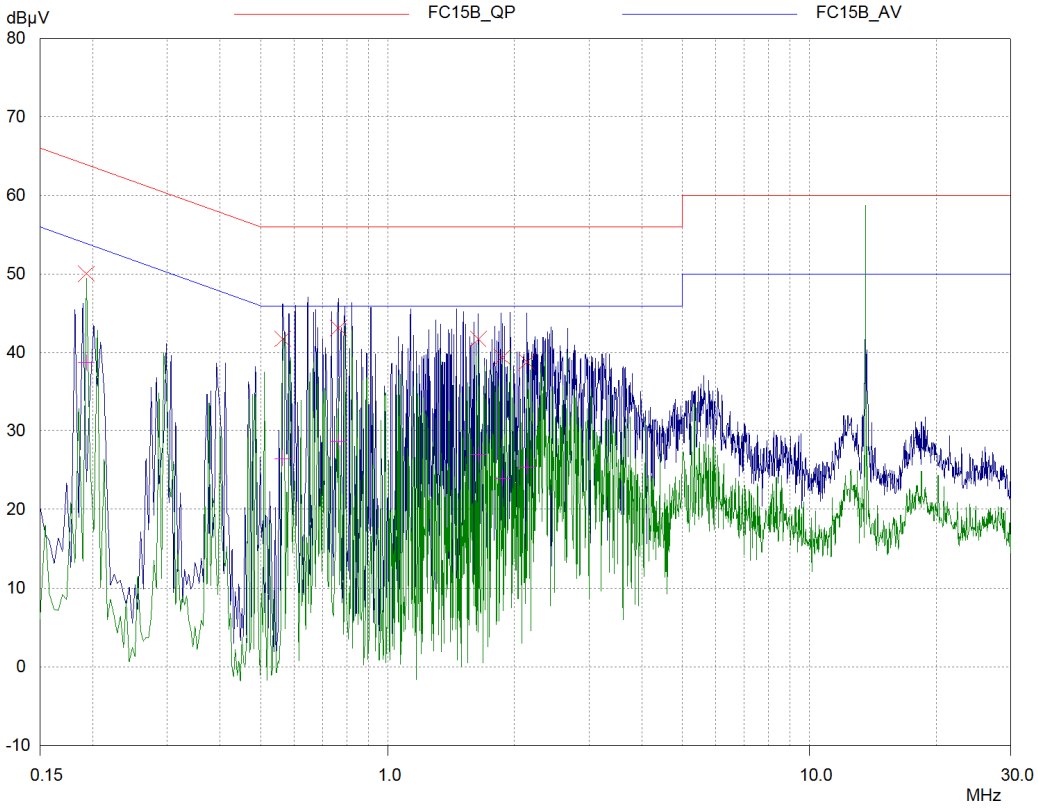
3.The LISN was connected with 120V AC/60Hz power source.

**Measurement Result**

Operation mode:RFID working mode

Note:All test modes have been tested.

**L line:**

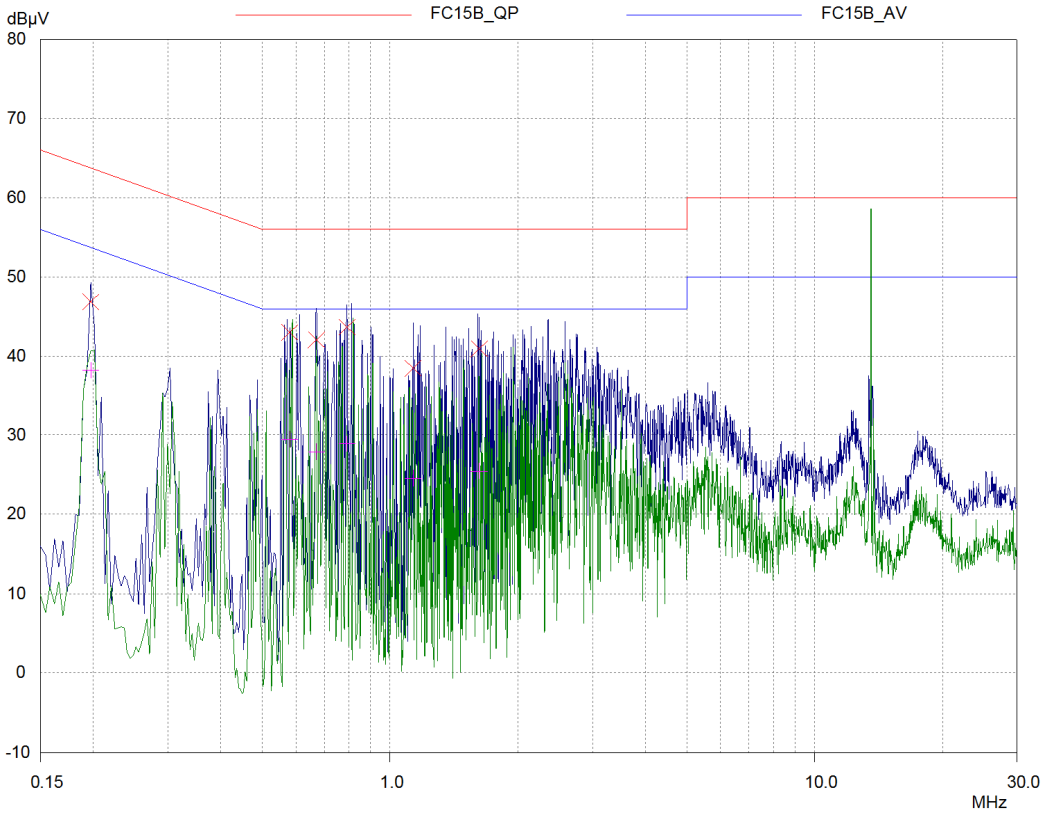



Final Measurement Results

| Frequency MHz | QP Level dBµV | QP Limit dBµV | QP Delta dB |
|---|---|---|---|
| 0.19296 | 50.03 | 63.91 | 13.88 |
| 0.56406 | 41.77 | 56.00 | 14.23 |
| 0.76328 | 43.16 | 56.00 | 12.84 |
| 1.63828 | 41.76 | 56.00 | 14.24 |
| 1.86875 | 39.41 | 56.00 | 16.59 |
| 2.13437 | 38.85 | 56.00 | 17.15 |

| Frequency MHz | AV Level dBµV | AV Limit dBµV | AV Delta dB |
|---|---|---|---|
| 0.19296 | 38.77 | 53.91 | 15.14 |
| 0.56406 | 26.48 | 46.00 | 19.52 |
| 0.76328 | 28.61 | 46.00 | 17.39 |
| 1.63828 | 26.96 | 46.00 | 19.04 |
| 1.86875 | 23.96 | 46.00 | 22.04 |
| 2.13437 | 25.40 | 46.00 | 20.60 |

**N Line:**




Final Measurement Results

| Frequency MHz | QP Level dBµV | QP Limit dBµV | QP Delta dB |
|---|---|---|---|
| 0.19687 | 46.85 | 63.74 | 16.89 |
| 0.57656 | 43.03 | 56.00 | 12.97 |
| 0.66953 | 42.11 | 56.00 | 13.89 |
| 0.79062 | 43.68 | 56.00 | 12.32 |
| 1.13046 | 38.53 | 56.00 | 17.47 |
| 1.62265 | 40.95 | 56.00 | 15.05 |

| Frequency MHz | AV Level dBµV | AV Limit dBµV | AV Delta dB |
|---|---|---|---|
| 0.19687 | 38.22 | 53.74 | 15.52 |
| 0.57656 | 29.40 | 46.00 | 16.60 |
| 0.66953 | 27.85 | 46.00 | 18.15 |
| 0.79062 | 28.87 | 46.00 | 17.13 |
| 1.13046 | 24.53 | 46.00 | 21.47 |
| 1.62265 | 25.40 | 46.00 | 20.60 |

## 4.9.3 Occupied Bandwidth Test

**Test Requirement:** FCC 15.215( c) & RSS-Gen Issue 3 Section 4.6.1

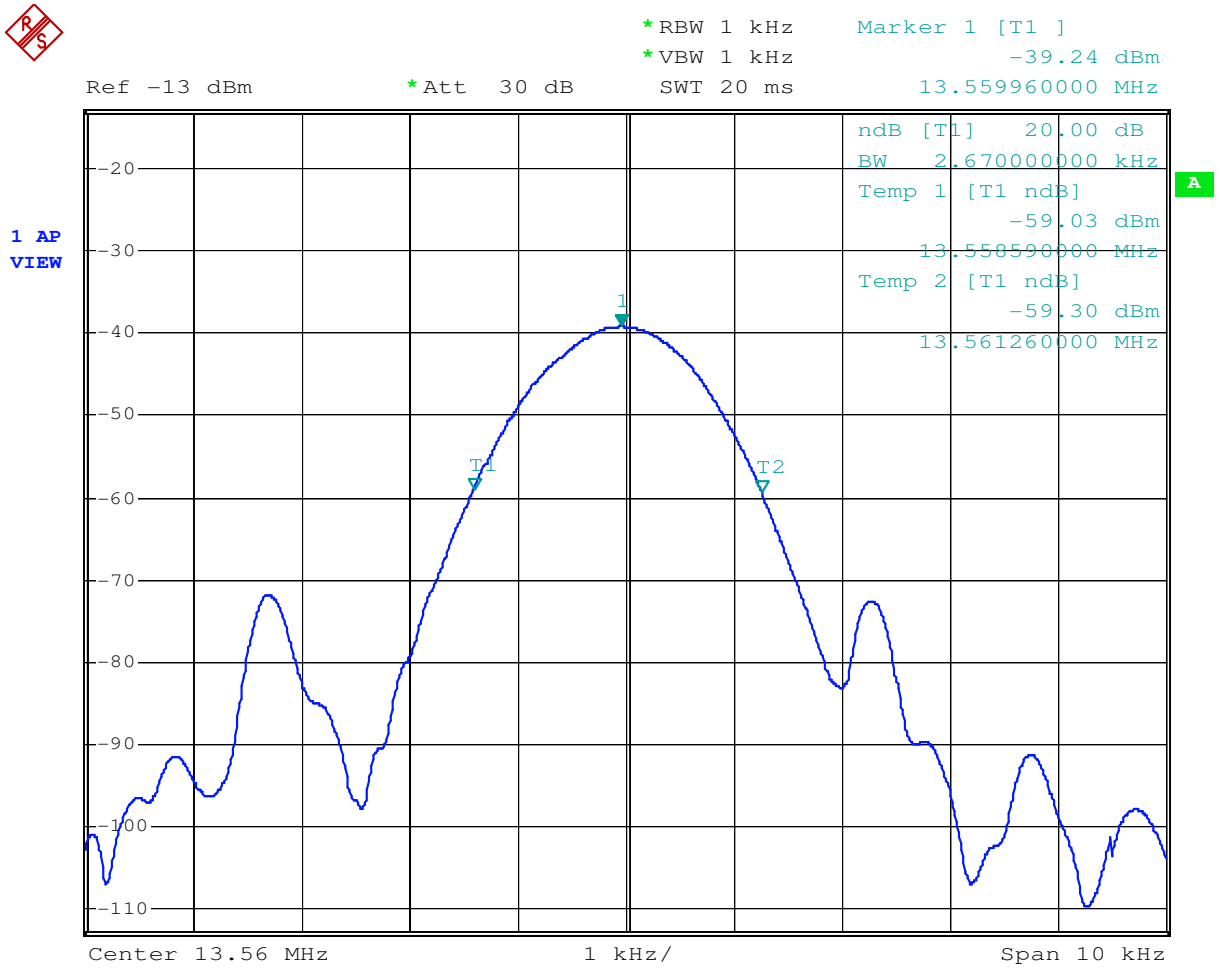
**Test date:** Jun. 6, 2012

**EUT Setup**

1. The transmitter output is connected to the spectrum analyzer.
2. The bandwidth of the fundamental frequency was measured with the spectrum analyzer using RBW=1 kHz, VBW=1 kHz and Span=10 kHz.
3. The bandwidth of fundamental frequency was measured and recorded.

**Measurement Result:**

| Carrier Frequency (MHz) | 20dB Bandwidth (KHz) |
|---|---|
| 13.5600 | 2.67 |



## 4.9.4 Frequency Tolerance

**Test Requirement:** FCC Part15 15.225e
**Test date:** August. 9, 2012
**Standard Applicable** ANSI C63.10:2009
**EUT Setup**

**Limit**

**15.225 Operation within the band 13.110 – 14.010 MHz.**

(e) The frequency tolerance of the carrier signal shall be maintained within +/- 0.01% of the operating frequency over a temperature variation of –20 degrees to +50 degrees C at normal supply voltage, and for a variation in the primary supply voltage from 85% to 115% of the rated supply voltage at a temperature of 20 degrees C. For battery operated equipment, the equipment tests shall be performed using a new battery.

**Measurement Result:**

| Temp. (℃) | P/S Voltage (VAC) | Frequency (MHz) | Limit (±Hz) | Offset from the CF (Hz) | Limit (%) | Error (%) |
|---|---|---|---|---|---|---|
| Center Freq. | | 13.5600MHz | | | | |
| 20 | 120 | 13.56001 | 1356.00 | 10 | 0.01 | 0.00 |
| 20 | 102 | 13.56001 | | 10 | | 0.00 |
| 20 | 138 | 13.56001 | | 10 | | 0.00 |
| -10 | 120 | 13.56003 | | 30 | | 0.00 |
| -20 | 120 | 13.56004 | | 40 | | 0.00 |
| 0 | 120 | 13.56003 | | 30 | | 0.00 |
| 10 | 102 | 13.56002 | | 20 | | 0.00 |
| 30 | 138 | 13.56003 | | 30 | | 0.00 |
| 40 | 120 | 13.56004 | | 40 | | 0.00 |
| 50 | 120 | 13.56005 | | 50 | | 0.00 |

## 4.9.5 Antenna Requirement

**Test Requirement:** FCC Part15 15.203

**5.3.7.1 Standard Requirement**

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this Section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

**5.3.7.2 Antenna Connected Construction**

The antenna connector is de-signed with permanent attachment and no consideration of replacement. Please see EUT photo for details.

**5.3.7.3 Result**

The EUT antenna is integral Antenna. It comply with the standard requirement.

## End of Test Report